Remarks

Claims 1-5, 9, 20 and 37-49 were pending and examined. With the above amendment, applicants amend claim 1 and cancel claims 2-5 and 20 to more particularly point out and distinctly claim the invention. The pending claims are now 1, 9, and 37-49.

Information Disclosure Statement

Applicants provide herewith an Information Disclosure Statement for this case. An enclosed check for $235 includes the $180 fee designated in 37 C.F.R. 1.17(p), as provided under 37 C.F.R. 1.97(c).

Rejections under 35 U.S.C. 112, first paragraph

Claims 1-5, 20, 37-38, and 45 stand rejected under 35 U.S.C. 112, first paragraph, written description requirement. It is asserted that the specification does not describe the regulation of smooth muscle tone by introduction of any nucleic acid sequences encoding potassium channel proteins other than Maxi-K and Kir6.2. Applicants respectfully request reconsideration and withdrawal of this rejection based on the following discussion.

Applicants assert that the description for the claimed methods is provided such that the skilled artisan would understand that the inventors had possession of the claimed invention. To support this assertion, applicants point to page 27, line 16-page 28, line 27. There, reference to genes of more than 30 potassium channels are provided. Also, applicants have demonstrated the effectiveness of two of these potassium channels in the practice of the claimed invention.

Given the above, the skilled artisan would understand that, since two different potassium channels proved to be effective in the claimed methods, it is likely that the effectiveness of the claimed method is due to the provision of a potassium channel, and

not just the particular potassium channels utilized. The skilled artisan would also understand that any known potassium channel gene (referenced in the specification) could be transfected into urogenital smooth muscle cells by routine methods (e.g., as provided in the instant specification) such that the potassium channel genes would be expressed in the cells. It would be further understood that such expression of any known potassium channel gene would be expected to regulate smooth muscle tone as claimed. Thus, every aspect of the claimed methods are adequately described in the specification, and there are no essential or critical elements that are not adequately described.

Applicants also point out that the written description requirement does not require that applicants provide the gene sequence of each potassium channel that is encompassed within the claims, particularly since a reference is provided that can lead the skilled artisan to any of those sequences ("... a patent need not teach, and preferably omits, what is well known in the art." *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 94 [Fed. Cir. 1986]).

In light of the above discussion, applicants assert that the skilled artisan, upon reading the specification, would understand that the applicants fully conceived and described in the specification how to practice the claimed invention, and no aspect of the claimed invention is left out. Applicants therefore respectfully request withdrawal of the rejection under 35 U.S.C. 112, first paragraph, written description requirement.

The pending claims also stand rejected under 35 U.S.C. 112, first paragraph, enablement requirement. It is asserted that the claims are not enabled for the full scope of any potassium channel, any smooth muscle, or to provide increased contractility of the targeted smooth muscle. Applicants respectfully request reconsideration and withdrawal of this rejection based on the following discussion.

Applicants first note that the claims as amended are only directed to providing less heightened contractility. Additionally, as discussed above in relation to the written

description rejection, the claims are enabled for any potassium channel protein. To reiterate that discussion, since the present specification establishes that the claimed methods work with two separate potassium channel proteins and two separate urogenital smooth muscles, it is clear that the provision of a potassium channel is the critical step in providing less heightened contractility of urogenital smooth muscle. There is no reason to believe that any other gene encoding a potassium channel could not substitute for the maxi-K gene or the K_{ATP} gene in providing a potassium channel, since methods, such as those provided in the specification, are routine for expressing a potassium channel in a smooth muscle cell. Since two separate potassium channel genes are demonstrated to provide sufficient expression in the smooth muscle cells of two separate urogenital smooth muscles, the skilled artisan would understand that there is a reasonable likelihood of success in using any potassium channel gene to achieve less heightened contractility of urogenital smooth muscle.

Based on the above, applicants assert that the present specification provides a presumptively enabling disclosure. Although the Patent Office asserts that gene therapy is too unpredictable to allow a reasonable expectation of success for any potassium channel, applicants have provided two working examples of potassium channels whose expression was sufficient in two different urogenital smooth muscle tissues to provide less heightened contractility. Therefore, the skilled artisan would understand that gene therapy with respect to potassium channels in urogenital smooth muscle was sufficiently predictable such that sufficient expression to cause less heightened contractility of urogenital smooth muscle would be expected with any potassium channel gene. Applicants thus believe that the specification provides a presumptively enabling disclosure for the claimed invention.

Based on the above, applicants believe that the instant specification is presumptively in compliance with the enablement requirement, and to sustain the enablement rejection, the Patent Office must provide acceptable evidence or reasoning

which is inconsistent with the above assertions supporting enablement. *In re Marzocchi*, 169 USPQ 367, 370 (CCPA 1971). Specifically, applicants believe that, to maintain the current enablement rejection, the Patent Office should provide specific evidence that expression of any other known potassium channel gene in urogenital smooth muscle would not be expected to achieve less heightened contractility of that smooth muscle, even though the specification discloses success with two separate potassium channel genes.

With regard to the gene delivery aspect of the enablement rejection, applicants note that the amended claims are directed to the direct introduction and expression of the potassium channel, which would be expected to be effective, based on the exemplified embodiments in the specification.

In light of the claim amendments and the above discussion, applicants request withdrawal of the current rejection under 35 U.S.C. 112, first paragraph, enablement requirement.

Double Patenting

Applicants provide herewith a terminal disclaimer in compliance with 37 C.F.R. 1.321(c) to overcome the double patenting rejection over U.S. Pat. No. 6,271,211. The enclosed check for $235 includes the $55 small entity fee for the enclosed Terminal Disclaimer. Applicants therefore request withdrawal of the current double patenting rejection.

Conclusion

In light of the claim amendments and the above remarks, applicants respectfully request withdrawal of all rejections and passage of the claims to allowance. If there are any minor matters that would prevent allowance of the claims, applicants request that Examiner Paras contact the undersigned attorney.

It is believed that the enclosed check for $235 (for the Information Disclosure Statement [$180] and the Terminal Disclaimer [$55]) is all that is due and necessary to maintain the pendency of this application. However, if there are further unanticipated fees required to maintain the pendency of this application, the PTO is authorized to withdraw those fees from Deposit Account 01-1785. Overcharges may also be credited to Deposit Account 01-1785.

Respectfully submitted,

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Dated: New York, New York
May 21, 2002

By: _____
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Marked-up Claims After Amendment - U.S. Patent Application No. 09/531,969
Additions are underlined, deletions are bracketed.

1. (Twice amended) A method of causing less heightened contractility of a smooth muscle [regulating smooth muscle tone] in a urogenital tract of a subject, comprising the direct introduction and expression of a DNA sequence encoding a potassium channel protein in a sufficient number of smooth muscle cells of the urogenital tract of the subject to result in less heightened contractility of the smooth muscle [regulate smooth muscle tone]in the urogenital tract of the subject.

9. The method of Claim 1, wherein the potassium channel protein is maxi-K or K_{ATP}.

37. The method of Claim 1, wherein the smooth muscle cells are penile smooth muscle cells.

38. The method of Claim 1, wherein the smooth muscle cells are bladder smooth muscle cells.

39. The method of Claim 1, wherein the potassium channel protein is maxi-K.

40. The method of Claim 1, wherein the potassium channel protein is K_{ATP}.

41. The method of Claim 37, wherein the potassium channel protein is maxi-K.

42. The method of Claim 37, wherein the potassium channel protein is K_{ATP}.

43. The method of Claim 38, wherein the potassium channel protein is maxi-K.

44. The method of Claim 38, wherein the potassium channel protein is K_{ATP}.

45. The method of Claim 1, wherein the DNA sequence is introduced by naked DNA transfer.

46. The method of Claim 41, wherein the DNA sequence is introduced by naked DNA transfer.

47. The method of Claim 42, wherein the DNA sequence is introduced by naked DNA transfer.

48. The method of Claim 43, wherein the DNA sequence is introduced by naked DNA transfer.

49. The method of Claim 44, wherein the DNA sequence is introduced by naked DNA transfer.